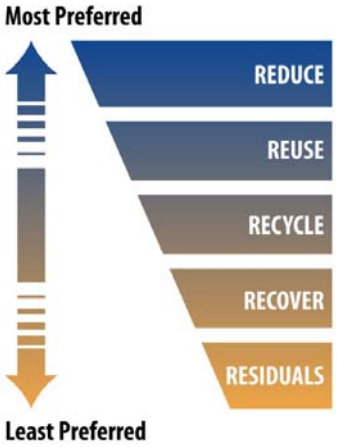
Source Reduction
Definitions/Framework/Options

Source reduction activities reduce the amount of materials entering the waste stream and are considered the most preferred waste management approaches under the USEPA, NDEQ and City-County hierarchy. Source reduction includes conservation, waste reduction, and material reuse. Most waste reduction activities require the individual residences, businesses and governments to take steps to adopt or change their way of thinking of waste and their waste generating and disposal habits. The recommendations and programs resulting from the Solid Waste Plan 2040 can encourage, support and provide additional opportunities for changes in thinking and waste generation/management habits by implementing programs that target source reduction practices as described below and in other related technical evaluations.



Definitions

There are many definitions of Source Reduction. The USEPA states "**Source Reduction** refers to any change in the design, manufacture, purchase, or use of materials or products (including packaging) to reduce their amount or toxicity before they become municipal solid waste. Source reduction also refers to the **reuse** of products or materials." Within the content of other related technical evaluations additional definitions are provided to describe various waste and source reduction programs including the following:

- Zero Waste
- Product Stewardship
- Household Hazardous Waste

As defined by the Grass Roots Recycling Network, **Zero Waste** includes "recycling" but goes beyond to address the reduction of "upstream" waste created through mining, extraction, and manufacturing of products. Zero waste maximizes recycling, minimizes waste, reduces consumption and encourages the development of products that are made to be reused, repaired or recycled back into nature or the marketplace.

The Product Stewardship Institute (PSI) defines **product stewardship** as the act of minimizing health, safety, environmental and social impacts and maximizing economic benefits of a product and its packaging throughout all lifecycle stages. The PSI further defines **extended producer responsibility** (EPR) as a mandatory type of product stewardship that includes, at a minimum, the requirement that the producer's responsibility for their product extend to post-consumer management of the product and its packaging.

Framework

In the United States today, two topics with significant emphasis on source reduction include the philosophy and design principle associated with zero waste and product stewardship. These principles contain conservation and recovery principles very similar to those embodied in the 1976 federal Resource Conservation and Recovery Act (RCRA), which set national goals to:

1. To protect human health and the environment from the potential hazards of waste disposal
2. To conserve energy and natural resources
3. To reduce the amount of waste generated
4. To ensure that wastes are managed in an environmentally sound manner

As an overarching concept, Zero Waste encompasses all waste reduction, as well as reuse, recycling, and diversion options. Product Stewardship focuses on minimizing health, safety, environmental and social impacts and maximizing economic benefits of a product and its packaging throughout all lifecycle stages.

The City-County currently support a wide range of public and private waste reduction programs for source reduction. These efforts may be best illustrated in the *Lincoln-Lancaster County's Official 2012 Waste Reduction & Recycling Guide*, and through the following websites and related links:

- City's Solid Waste Operation's website
  http://lincoln.ne.gov/city/pworks/waste/sldwaste/
- Lincoln-Lancaster County Health Department's website
  http://lincoln.ne.gov/city/health/environ/pollu/index.htm

Options

Though-out the development of the Solid Waste Plan 2040 there will be evaluations of a wide range of system, facilities and program options and alternatives. Based on the nature of the topics to be considered and evaluated many of these topics overlap other source reduction considerations. For example, education programs can encourage source reduction and recycling, identify options for waste toxicity reduction, provide information on safe and proper waste disposal, and serve as a basic decision making resource for understanding waste management alternatives.

Many of the available source reduction programs are based on dealing with wastes after they are generated (avoiding disposal and reducing toxicity). A key part of the overall diversion and minimization effort involves educating consumers and waste generators about options to avoid, prevent or minimize waste generation. The concept of source reduction is equally important for household hazardous waste and commercial/industrial/institutional materials. Source reduction and alternative management options occur through both public and private efforts, as illustrated in the *Lincoln-Lancaster County's Official 2012 Waste Reduction & Recycling Guide*.

There are a wide range of source reduction options. The following are considered basic options associated with Source Reduction. Other topical evaluations will provide greater detail on various related and overlapping programs and options. These can generally be grouped into the following broad categories:

- Education
- System, Facilities and Program Alternatives
- Purchasing Practices
- Bans and Restrictions
- Incentives

The Needs Assessment provides greater detail on existing source reduction programs. The following overview is intended to highlight general types of source reduction options. Again, it is

important to recognize that there are a wide range of existing and potential future options, and not all are included below.

Education

A key part of the overall diversion and minimization effort is educating consumers on options to avoid or minimize waste generation and disposal; additional efforts focus on changing behavioral patterns and the way people and businesses think (sustainable materials management). The success of source reduction programs is dependent on continuous education of the public and businesses. Education is important to any consumer-targeted source reduction and recycling program.

Successful education program are generally geared toward multi-media education efforts and providing training and hands-on education. Major components of such programs typically include:

- **Program Awareness**: education programs that increase the public and businesses knowledge and understanding of available programs, as well as various waste reduction techniques and solid waste diversion options
- **Management Alternatives**: education programs that target reduce and reuse options, consumer alternatives, sustainable materials management, toxicity reduction, and short- and long-term behavioral changes. These include programs that address hazardous waste reduction, substitutes for hazardous products, and appropriate and safe methods for management or disposal
- **Waste Reduction**: programs that target specific waste reduction practices such as "Don't bag it" or "Let it lie" (that discourage collection/bagging of lawn waste), or backyard composting of lawn waste

Systems, Facilities and Programs

Beyond the educational effort, opportunities (systems, facilities and programs) must exist to divert and avoid disposal of materials that might otherwise become waste. With more than half of the municipal solid waste (MSW) generated in the Planning Area estimated to come from non-residential sources it is important that these opportunities exist for both residents as well as businesses (the commercial/industrial/institutional) community.

Programs may include educational components and waste audits, but ultimately need to include systems and facilities to provide for diversion opportunities. These systems and facilities include sites, equipment, structures, and personnel utilized for the purpose of collection, storage, transportation, transfer, processing, and treatment of diverted materials. Again, many such systems, facilities and programs exist in public, private and public/private partnerships within the Planning Area. Some simple examples include: charitable re-use options, material exchanges and reuse facilities and buy-back centers, as well as the wide range of retail and take-back facilities, as listed on pages 6 and 7 of the *Lincoln-Lancaster County's Official 2012 Waste Reduction & Recycling Guide*.

Purchasing Practices

There is a wide variety of source reduction practices focused on purchasing practices geared toward generating less waste, in part by increasing product efficiency and effectiveness. Some of these are embodied in product stewardship and environmentally preferred purchasing strategies. Such strategies can be voluntary or mandatory (e.g., embedded in business or government purchasing policies). Keep America Beautiful (KAB) lists the following source

reduction related purchasing practices; KAB attributes this list to the National Recycling Coalition:

1. Rent or lease products or equipment.
2. Purchase rebuilt, remanufactured or refurbished products.
3. Purchase more durable products.
4. Purchase products containing nonhazardous materials.
5. Purchase products that are reusable, refillable, or returnable.
6. Purchase products in bulk.
7. Purchase products with less packaging or reuse packaging.

In the case of Lincoln this could include the purchase of City produced compost (LinGro). A significant aspect of the source reduction also attempts to focus consumers on the idea of purchase of durable, as opposed to non-durable goods, when given an option.

Bans and Restrictions

Whereas educational initiative generally focuses on voluntary participation, legislation can also be used to mandate changes. Federal, state and some local legislation/ordinances can be used to accelerate the implementation of source reduction programs. Legislation/ordinance can also have unforeseen side effects and will need be considered carefully.

Bans and restriction are an indirect means of providing source reduction. They do not necessarily reduce waste but rather use legislation to change management options and possibly purchasing practices. In Nebraska certain materials are banned from landfill disposal (e.g., tires, waste oils, lead acid batteries, appliances, and yard waste). In addition, Lincoln businesses are not allowed to dispose of hazardous waste in the landfill. These do not necessarily reduce waste generation but create the need for alternate management approaches, which often include recycling and reuse. Bans on tires, batteries and appliances do not serve to decrease the quantity of materials purchased or the need for end-of life management. However, seasonal landfill bans on yard waste (lawn waste) have created some interesting dynamics in the waste management industry.

Seasonal yard waste bans have created the need for separate collection and management systems for those individuals that choose to collect and "bag" their lawn waste; in the Planning Area this management need has been addressed in part by the City's construction of a large scale composting facility at the Bluff Road Landfill and the separate material receiving and handling facilities at the City's N. 48th Street Landfill, along with the need for post-composting marketing and utilization of the resultant product (marketed as LinGro Compost). In the Planning Area private haulers will collect and transport the grass and leaves to composting facilities for a fee; once collected they can also haul them to certain landfills outside of Lancaster County for disposal, if the facility has an active landfill gas utilization program. Source reduction strategies for lawn waste, while focused on reduction at the source (e.g., "Don't Bag It") also recognize the need for non-disposal management options within the Planning Area.

Incentives

Incentive and penalty systems are another indirect means of providing source reduction. They do no necessarily reduce waste but rather change management options and possibly disposal practices. While most incentive programs focus on financial incentives, there are other types of incentive programs, such as recognition programs.

Some examples of incentive programs include:

- **Rate Structures:** such as of “pay as you throw”, “volume based” rate structures and extended producer responsibility laws. In rate structure type of systems, waste generators pay a monthly fee that increases as the volume, or weight of disposed waste increases with a goal of allowing the waste generator to see a direct relationship between the amount they discard and the cost for collection service. Research on pay as you throw programs suggests that in addition to increasing recycling rates that such programs have resulted in a removal of 6 percent of the residential waste stream by source reduction (Including buying in bulk, buying items with less packaging, donating of reusable goods to charities). This concept is largely already in place for commercial/industrial and institutional waste generators. These can apply to typical MSW as well as material such as yard waste. If fact, under the current Planning Area collection system, if you choose to have collected yard waste removed from your residence or business you typically pay an added fee (pay as you throw). The extent to which this is volume based has not been determined. Under the extended producer responsibility laws the cost of such take back or end of life cost has been included in the initial purchase price.
- **Grants:** available state grant programs focus helping communities implement and maintain waste reduction and recycling programs, including funding household hazardous materials management systems. Grant programs could also be constructed by the City to encourage development of new product markets or help businesses implement systems, facilities and programs targeting source reduction.
- **Subsidies or Incentives:** such as convenience facilities for recyclables, support to diversion events (e.g., electronics or HHW drop-off) or to support operations of HHW programs.
- **Mandated Recycling:** Recently a select group of communities in the US have developed policies and programs that require residential waste recycling and include penalties (e.g., fines and lack of garbage pick-up) for those who do not recycle or include recyclable materials in their waste. Mandated recycling/diversion can also include recovery and diversion requirements associated with demolition or construction projects, especially projects that utilize public funds. Where mandated recycling is required for construction demolition projects they generally require submission of a waste management plan, as part of the permitting process.

Summary

Source reduction activities reduce the amount of materials entering the waste stream and are considered the highest ranking waste management approach under the USEPA, NDEQ and City-County hierarchy. Most waste reduction activities require the individual residences, businesses and governmental institutions to take steps to adopt or change their way of thinking of waste and their waste generating and disposal related habits; these typically involve an educational or promotional component. Other waste reduction activities use economic measures (e.g., purchasing practices, subsidies, take back programs) to further incentivize waste minimization, toxicity reduction and producer responsibility. The recommendations and programs resulting from the Solid Waste Plan 2040 can encourage these changes in habits by implementing programs that target a wide array of source reduction practices. Programs for source reduction should target residential waste, as well as potential wastes from the business, industry and institutional community. They can be mandatory or voluntary. To be effective they will likely need to consider broad perspective approaches such as zero waste and product stewardship and specific material focused programs such as HHW and lawn waste.